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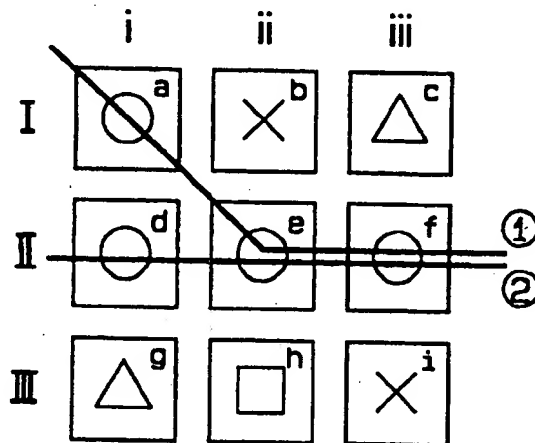
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(54) **Multi-line game machine**

(57) A gaming machine has a display on which an array of patterns a-i may be displayed. Paylines are defined to include series of displays that form not only straight lines 2 such as the rows or columns and diagonals but also combinations of displays including one display from each column that do not define a straight line 1. This definition of paylines allows a potentially winning payline to be generated incremental as a pattern is generated on each additional display one-by-one as the game progresses. Thus, a first payline, for example the centre row, can be generated. Next, a bet can be accepted and a pattern generated on a single additional display. The new display will form at least one new payline. Adding another display will form even more paylines so that the number of paylines added with each additional display increases as the number of bets are made.

Fig.3

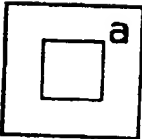
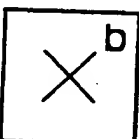
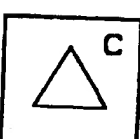
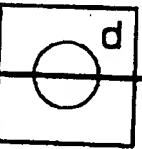
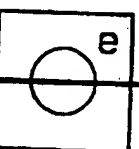
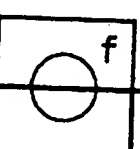
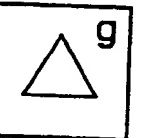
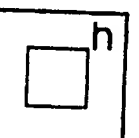
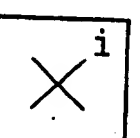


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Fig. 1

	i	ii	iii
I	a	b	c
II	d	e	f
III	g	h	i

Fig. 2

	i	ii	iii
I	 ^a	 ^b	 ^c
II	 ^d	 ^e	 ^f
III	 ^g	 ^h	 ⁱ

①

Fig.3

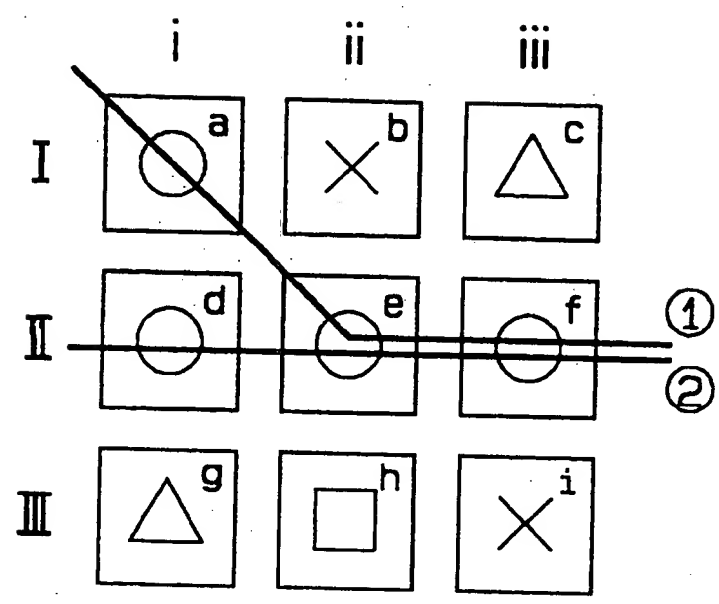


Fig.4

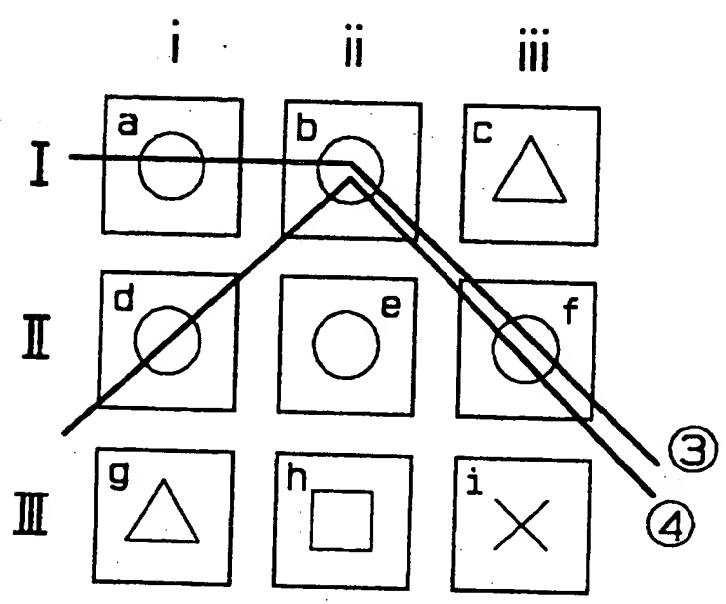


Fig. 5

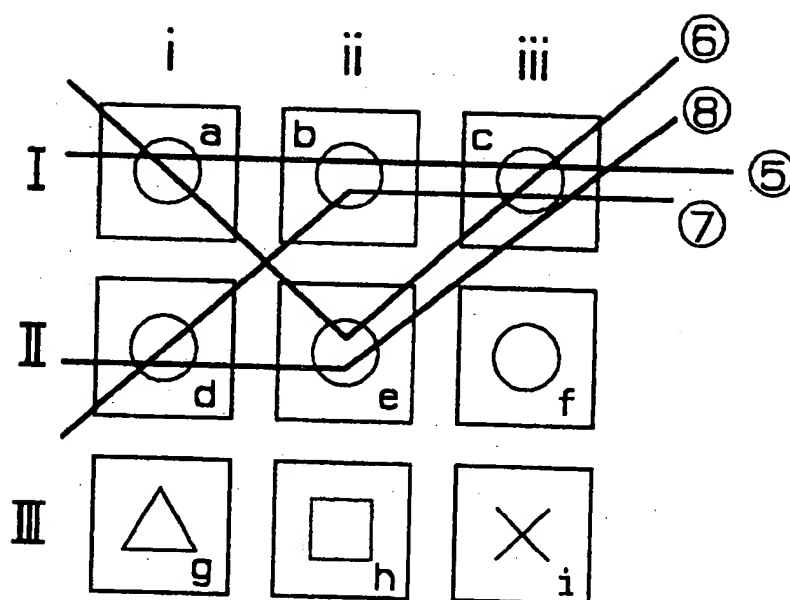


Fig. 6

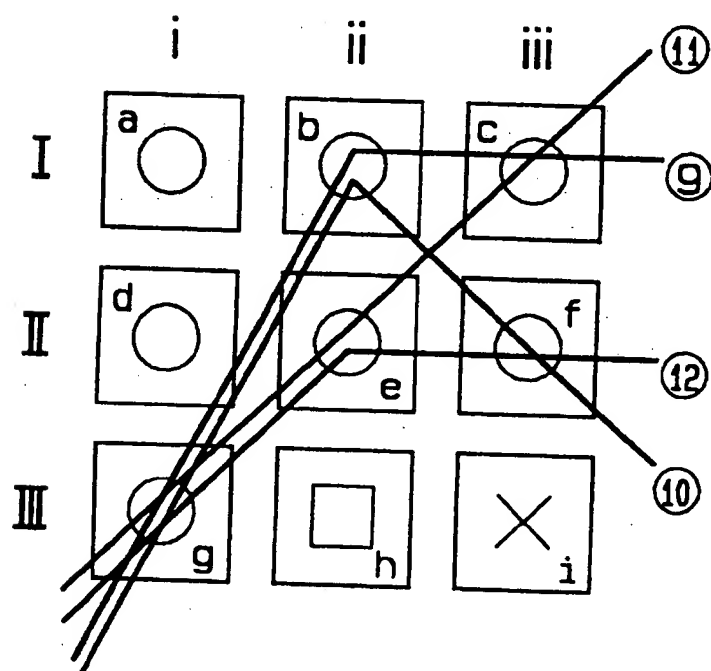


Fig. 7

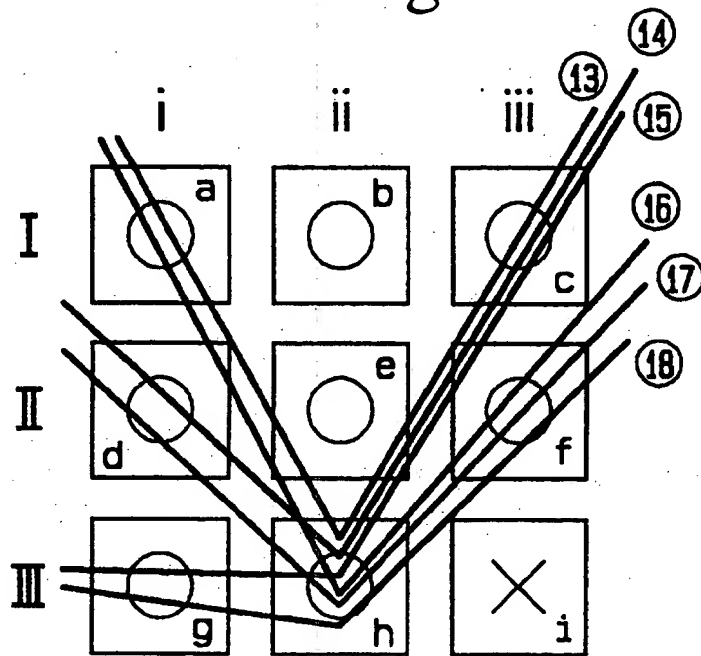
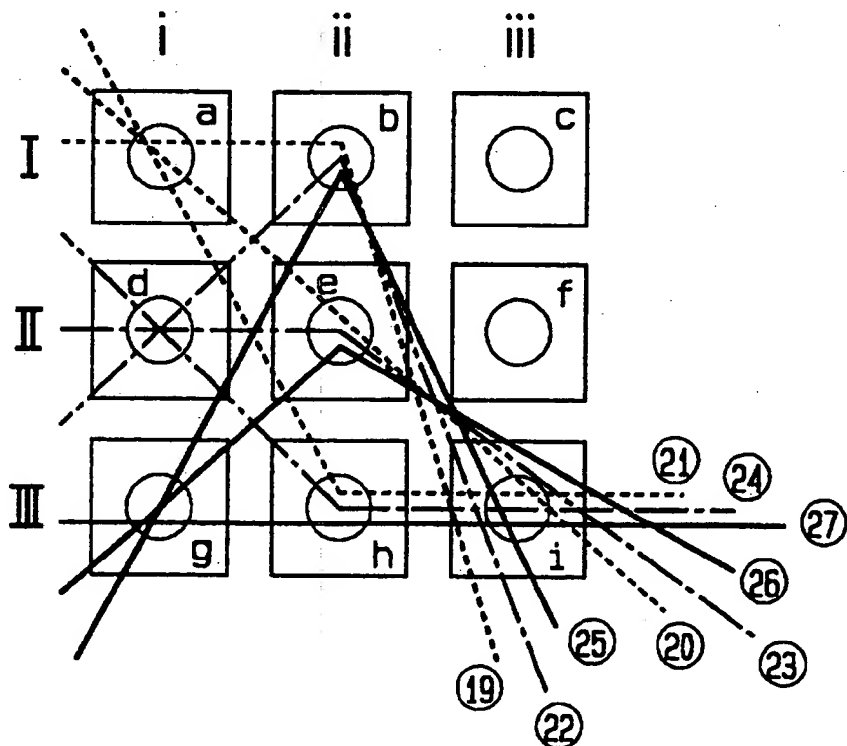


Fig. 8



SLOT MACHINE GAME

This invention relates to a game machine which implements a method for setting the paylines (hit arrangements).

In the early days of mechanical slot machines, there was only a single horizontal payline. That is, in early machines, three slot reels rotated independently of each other around a horizontal main shaft. On the front of the machine there was a long, narrow horizontal viewing window through which, when the slot reels were stopped, one could see each of the patterns displayed in the front, forming a horizontal row of three patterns in all. When the combination of the patterns matched any of a number of preset winning combinations, a number of tokens or coins were paid out.

Since slot machines of the video type emerged, slot machines having multiple paylines have been proposed. Even if only three virtual slot reels are used, a video-type virtual reel may be infinitely long, making it possible to have a great variety of combinations of figures that appear continuously, and therefore one need not repeatedly use again a combination of figures that has appeared continuously once. Thus slot machines have been proposed in which there is a display area for displaying nine

patterns arranged in three rows and three columns. In this proposal, there is not just the central horizontal payline shown in Figure 2, but a total of five paylines, including also the one row each above and below, and the one row each of the diagonal lines extending from upper left to lower right and from upper right to lower left.

Slot machines have also been proposed in which one virtual slot reel is displayed in each of the nine pattern display areas arranged in these three rows and three columns with a total of eight paylines, consisting of three rows each vertically and horizontally, plus the two diagonal rows.

Increasing the number of paylines in this way increases the probability of winning and increases the player's interest. The number of paylines can be increased by increasing the number of pattern display areas, but in a slot machine having nine pattern display areas arranged in three rows and three columns, the maximum number of paylines, as described above, was eight.

It is an object of the invention to provide a game that provides enhanced interest to a user.

The present invention is as claimed in the claims.

According to one aspect of the present invention, there is provided a game machine, comprising; a programmable controller, an array of displays, a display

drive connected to drive the array of displays, the controller having an output to indicate a winning event, a user input connected to the controller to indicate to the controller the placing of a bet, a first series of the displays defining a first payline, a second series of the displays defining a second payline, the controller being programmed to show a selected pattern on each of the displays, the controller being programmed to show selected patterns on each of the displays representing a first payline, then, in response to the user input, showing a respective pattern on at least one additional display, the at least one additional display being selected that, in combination with at least one of the displays representing the first payline, a second payline is represented that includes the at least one additional display and the controller being further programmed to indicate the winning event on the output when the displays representing either of the first and second paylines shows a respective predefined combination of patterns.

Briefly, a video slot machine has an array or matrix of displays. Paylines are defined to include series of displays that form not only straight lines such as the rows or columns and diagonals but also combinations of displays including one display from each column that do not define a straight line. This definition of paylines allows

potentially winning paylines to be generated incremental by as a pattern is generated on each additional display one-by-one as the game progresses. Thus, a first payline, for example the centre row, can be generated. Next, a bet can be accepted and a pattern generated on a single additional display. The new display will form at least one new payline. Adding another display will form even more paylines so that the number of paylines added with each additional display increases as the number of bets are made.

According to an embodiment, the invention provides a mechanism for setting the paylines, that is, a method for win/lose decisions in new picture combination game machines whereby a maximum of $3 \times 3 \times 3 = 27$ paylines can be set even in a machine having nine pattern display areas arranged in three rows and three columns, and a maximum of the n th power of $m(m^n)$ paylines can be set in the case of a machine having pattern display areas arranged in m rows and n columns.

According to another aspect of the present invention, there is provided a game machine, comprising: an $m \times n$ array of displays with a display drive and controller programmed to generate a pattern in each of the displays, the controller being programmed to generate a pattern in each of a first series of the displays defining a first

payline, the controller being programmed to generate another pattern in at least one additional display, the at least one additional display being one of a second series defining a second payline that includes at least one is display from the first series, a win indicator connected for output to the controller, the controller outputting a win indication to the win indicator when either of the first and second series matches a predefined combination of patterns.

In a win/lose decision method in a picture combination game machine where patterns that each change in sequence are displayed each in a pattern display area of a picture combination machine having pattern display areas arranged in m rows and n columns, next the change of the patterns is stopped in sequence and one still pattern is displayed in each pattern display area, and win/lose decisions are made according to whether a portion that matches a preset winning arrangement exists in the arrangement of the displayed still patterns, and in a win/lose decision method is said picture combination game machine that is characterized in that at the time of bet 1 at least one pattern display area is specified in each column, and as the bet number increases by one in sequence, at least one pattern display area is additionally specified, and in making the win/lose decision, the entire arrangement of

patterns displayed in the pattern display areas specified one each selected from the pattern display areas specified for each column is compared in sequence with preset winning arrangements, and all the arrangements of patterns that match winning arrangements are declared to be winners.

This may be done in such a way that the pattern display in each column is done by one slot reel each, or in such a way that the pattern display in each pattern display area is done by one slot reel each.

It may also be done in such a way that the pattern display in each pattern display area is each changed randomly in sequence.

If nine pattern display areas are arranged in three rows and three columns, the pattern display area specified at the time of bet 1 is normally set to the pattern display area of the middle row.

Specification of the pattern display areas that are additionally specified in sequence as the bet number increases may be done one place at a time as the bet number is increased by one, according to a preset program, or it may be done one place at a time as specified by file player, or whether to specify an additional pattern display area to be done in sequence as the bet number increases may be determined according to the outcome of a simple game the player is made to play.

This invention may be applied not just to video-type slot machines and mechanical-type slot machines, but also to other known picture combination game machines.

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, of which:

Figure 1 is an explanatory diagram showing a game screen that has nine pattern display areas arranged in three rows and three columns in a picture combination game machine for implementing the win/lose decision method relating to this invention;

Figure 2 is an explanatory diagram showing an example in which the first payline is set to row II, which is the middle row in the game screen shown in Figure 1;

Figure 3 is an explanatory diagram showing an example in which, in addition to the first payline shown in Figure 2, one pattern display area is additionally set and a second payline is additionally set;

Figure 4 is an explanatory diagram showing an example in which, in addition to the paylines shown in Figure 3, still another pattern display area is additionally set, and third and fourth paylines are newly additionally set;

Figure 5 is an explanatory diagram showing an example in which, in addition to the paylines shown in Figure 4, still another pattern display area is additionally set, and

fifth through eighth paylines are newly additionally set;

Figure 6 is an explanatory diagram showing an example in which, in addition to the paylines shown in Figure 5, still another pattern display area is additionally set, and ninth through twelfth paylines are newly additionally set;

Figure 7 is an explanatory diagram showing an example in which, in addition to the paylines shown in Figure 6, still another display area is additionally set, and thirteenth through eighteenth paylines are newly additionally set; and

Figure 8 is an explanatory diagram showing an example in which, in addition to the paylines shown in Figure 7, still another pattern display area is additionally set, and nineteenth through twenty-seventh paylines are newly additionally set.

The game screen of the picture combination game machine shown in Figure 1 has nine pattern display areas a-i, arranged in three rows (I-III) and three columns (i-iii).

If it is a mechanical slot machine, normally the pattern display of each column is done by one rotatable slot reel, that is, column-i pattern displays a, d, g are drawn on the first rotatable slot reel, column ii pattern displays b, e, h are drawn on the second rotatable slot reel, and column-iii pattern displays c, f, i are drawn on

the third rotatable slot reel. When the game starts, the slot reel for each column rotates. Their patterns change at high speed. When a fixed time elapses each slot comes to a halt one after another, and one still pattern is displayed in each of the pattern display areas a-i. The win/lose decision is made according to whether a part that matches a preset payline, normally first the patterns of row-II pattern display areas d, e, f are all present in the arrangement of still pictures that are thus displayed.

In the case of a video-type slot machine, nine pattern display areas a-i can be switched randomly and independently of each other. It is possible to make the pattern display of the nine pattern display areas a-i each using a single slot reel.

This invention is not limited to nine pattern display areas arranged in three rows and three columns but can be applied to any picture combination game machine having pattern display areas arranged in m rows and n columns.

The win/lose decision method of this invention is such that at the time of a first bet, bet 1, at least one of the pattern display areas is specified in each column. As the bet number is incremented one by one in sequence, at least one pattern display area each is additionally specified. In making the win/lose judgement, the entire arrangement of patterns displayed in one specified pattern display area

selected from the pattern display areas specified in each column is sequentially compared with preset winning arrangements. All pattern arrangements that match a winning arrangement are declared to be winners. This is explained specifically for the case of three-row, three-column pattern display areas, referring to Figures 2 through 8.

As shown in Figure 2, at the stage of bet 1, as stated above, the pattern display areas d, e, f in the middle row (row II) are taken as the payline (the first payline), and when the patterns of this line are all aligned with preset winning patterns, a "winner" results.

Next, at the stage of bet 2, as shown in Figure 3, the one pattern display area a is additionally specified, second payline aef is newly set, and when these patterns are all present, a "win" is also declared.

Next, at the stage of bet 3, as shown in Figure 4, one further pattern display area b is additionally specified, and thereby third payline abf and fourth payline dbf are additionally set. At the stage of bet 4, as shown in Figure 5, one further pattern display area c is additionally specified, and thereby fifth payline abc, sixth payline aec, seventh payline dbc, and eighth payline dec are additionally set.

Similarly in the following, at the stage of bet 5, by

adding pattern display area g as shown in Figure 6, ninth payline gbc, tenth payline gbf, eleventh payline gec, and twelfth payline gef are additionally set. At the stage of bet 6, by adding pattern display area h as shown in Figure 7, 13th payline ahc, 14th payline dhc, 15th payline ghc, 16th payline ahf, 17th payline dhf, and 18th payline ghf are additionally set. At the stage of bet 7, by adding pattern display area i as shown in Figure 8, 19th payline abi, 20th payline aci, 21st payline ahi, 22nd payline dbi, 23rd payline dei, 24th payline dhi, 25th payline gbi, 26th payline gei, and 27th payline ghi are additionally set.

The sequence in which pattern display areas are additionally specified whenever the bet number is incremented by 1 may be arbitrarily determined, and the number is not limited to one place but may be set to multiple places.

The additional setting of these winning arrangements in accordance with the increase in the bet number may be done according to a preset program. In addition, it may be done according to player specification (the player chooses which display area to next specify), or the next display area to specify may be identified according to the outcome of a simple game the player is made to play.

The maximum number of paylines that can be set, that is, the maximum number of winning arrangements, in nine

pattern display areas arranged in three rows and three columns is the third power of 3. In general, given $m \times n$ pattern display areas arranged in m rows and n columns, the number of winning arrangements that can be set in this invention is m^n .

Using this invention being composed as described above, with this invention it is possible to set many more winning arrangements than formerly even if the number of pattern display areas in a picture combination game machine is small, thereby making it possible to increase the probability of winning and to increase interest in the game.

CLAIMS

1. A game machine, comprising:

an $m \times n$ array of displays with a display drive and controller programmed to generate a pattern in each of said displays;

said controller being programmed to generate a pattern in each of a first series of said displays defining a first payline;

said controller being programmed to generate another pattern in at least one additional display, said at least one additional display being one of a second series defining a second payline that includes at least one display from said first series;

a win indicator connected for output to said controller;

said controller outputting a win indication to said win indicator when either of said first and second series matches a predefined combination of patterns.

2. A game machine, comprising:

a programmable controller;

an array of displays;

a display drive connected to drive said array of displays;

said controller having an output to indicate a winning event;

a user input connected to said controller to indicate to said controller the placing of a bet;

a first series of said displays defining a first payline;

a second series of said displays defining a second payline;

said controller being programmed to show a selected pattern on each of said displays;

said controller being programmed to show selected patterns on each of said displays representing a first payline, then, in response to said user input, showing a respective pattern on at least one additional display, said at least one additional display being selected such that, in combination with at least one of said displays representing said first payline, a second payline is represented that includes said at least one additional display; and

said controller being further programmed to indicate said winning event on said output when said displays representing either of said first and second paylines shows a respective predefined combination of patterns.

3. A machine as in claim 2, wherein said controller is

programmed to show said patterns according to a random or pseudo-random event.

4. A machine as in claim 3, further comprising,
another user input connected to said controller,
said controller being programmed to select said at least one additional display from among said displays responsively to said another user input.
5. A machine as in any preceding claim, further comprising:
another user input connected to said controller;
said controller being programmed to accept a sequence of inputs, representing user responses to a game controlled by said controller, via said another user input;
said controller being further programmed to select said at least one additional display from among said displays responsively to said sequence of inputs.
6. A machine as in any preceding claim, wherein a generation of a pattern on said displays includes sequentially generating a rapidly-changing time-series of patterns which slows until a single pattern is generated.
7. A machine as in claim 1, wherein said array of

displays forms an $m \times n$ matrix, where m and n are integers.

8. A machine as in claim 7, wherein m and n are both equal to 3.

9. A machine as in any preceding claim, wherein said at least one additional display is one additional display.

10. A machine as in claim 1, wherein:

said $m \times n$ array includes columns of displays;

said first series includes one display from each column.

11. A machine as in claim 10, wherein:

said controller is programmed to generate each pattern in said first series by generating patterns time-sequentially so that a pattern is generated in a first of said series and later a pattern is generated in a second of said series, and so on until patterns are generated in all of said displays in said series.

12. A game machine comprising:

means for displaying an array of displays, with a selected pattern on each of said displays;

means for determining if a specified series of

displays defining a first payline of displays corresponds to at least one predetermined combination of patterns,

means for specifying at least one additional display in response to a user input;

means for determining if any further series of displays defining any further paylines of displays and which includes any such additional specified at least one additional display and any previously specified displays, corresponds to at least one of the predetermined combination of patterns,

means for indicating a winning event if the payline or any further payline corresponds to at least one of the predetermined combination of patterns.

13. A machine as in any preceding claim, wherein:

said array of displays includes a series of columns;
and

each of said paylines is characterized by one display from each column.

14. A machine as in any preceding claim, wherein a showing of a pattern on a display includes generating a changing sequence of patterns on said display until a final pattern is generated, whereby said display appears to have a moving reel behind it suggestive of a mechanical-type slot

machine.

15. A game machine substantially as hereinbefore described with reference to the accompanying drawings.



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Claims searched: 1-15

Examiner: Paul Makin
Date of search: 27 October 1997

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK Cl (Ed.O): G4V
Int Cl (Ed.6): G07F 17/34
Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2213624 A (RYUTARO et al) see lines 12-22 on page 13.	1,7,8,9,10,13,14
X	EP 0698869 A1 (ARISTOCRAT et al) see buttons 54.	1-10,12,13,14

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